

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 (Currently amended): An isolated peptide selected from the group consisting of:

- Conotoxin-Af6: X₆GQDDSX₁X₁DSQX₂VMX₂HGQRRERR[^] (SEQ ID NO:1);
- Conotoxin-Bt1: GGX₁X₁VRX₁SAX₁TLHX₁LTX₅[^] (SEQ ID NO:2);
- Conotoxin-Bt2: GGX₁X₁VRX₁SAX₁TLHX₁ITX₅[^] (SEQ ID NO:3);
- Conotoxin-Bt3: DGX₁X₁VRX₁AAX₁TLNX₁LTX₅[^] (SEQ ID NO:4);
- Conotoxin-Bt4: GYX₁DDR₁X₁IAX₁TVRX₁LX₁X₁A# (SEQ ID NO:5);
- Conotoxin-Bt5: GGGX₁VRX₁SAX₁TLHX₁ITX₅[^] (SEQ ID NO:6);
- Conotoxin-Bu1: NX₅X₁TX₃IX₁IVX₁ISRX₁LX₁X₁I# (SEQ ID NO:7);
- Conotoxin-Bu2: NX₅X₁TX₃X₃NLX₁LVX₁ISRX₁LX₁X₁I# (SEQ ID NO:8);
- Conotoxin-C1: SDX₁X₁LLRX₁DVX₁TVLX₁LX₁RN# (SEQ ID NO:9);
- Conotoxin-C2: GDX₁X₁LLRX₁DVX₁TVLX₁LX₁RD# (SEQ ID NO:10);
- Conotoxin-C3: SDX₁X₁LLRX₁DVX₁TVLX₁PX₁RN# (SEQ ID NO:11);
- Conotoxin-C4: IX₁X₁GLIX₁DLX₁TARX₁RDS# (SEQ ID NO:12);
- Conotoxin-C5: IX₁X₁GLIX₁DLX₁AARX₁RDS# (SEQ ID NO:13);
- Conotoxin-C6: GX₁X₅X₁VGSIX₅X₁AVRQQX₁CIRNNNNRX₅X₄CX₅X₂[^] (SEQ ID NO:14);
- Conotoxin-Di1: TITAX₁X₁AX₁RTSX₁RMSSM# (SEQ ID NO:15);
- Conotoxin-Di2: X₆X₁TX₅TX₅X₁X₁VX₁RHTX₁RLKSM# (SEQ ID NO:16);
- Conotoxin-Ep1: GGKDIVX₁TITX₁LX₁X₂I# (SEQ ID NO:17);

Conotoxin-Fi1: GX₁X₁X₁VAX₁MAAX₁IARX₁NQAN# (SEQ ID NO:18);
Conotoxin-Fi2: SX₃X₁QARX₁VQX₁AVNX₁LX₂X₁R# (SEQ ID NO:19);
Conotoxin-Fi2a: SX₃X₁QARX₁VQX₁AVNX₁LX₂X₁RGX₂X₂IIMLG₁GVX₅R-
DTRQF[^] (SEQ ID NO:20);
Conotoxin-Fi3: D X₃X₁DDR₁X₁IAX₁TVRX₁LX₁X₁I# (SEQ ID NO:21);
Conotoxin-Fi4: GNTAX₁X₁VRX₁AAX₁TLHX₁LSL[^] (SEQ ID NO:22);
Conotoxin-Fi5: GSISMGFX₁HRRX₁IAX₁LVRX₁LAX₁I# (SEQ ID NO:23);
Conotoxin-L1: GX₁X₁X₁VAX₁MAAX₁IARX₁NAAN# (SEQ ID NO:24);
Conotoxin-L2: GX₂X₁X₁DRX₁IVX₁TVRX₁LX₁X₁I# (SEQ ID NO:25);
Conotoxin-L3: GX₁X₁X₁VAX₂MAAX₁LTRX₁X₁AVX₂# (SEQ ID NO:26);
Conotoxin-P1: GX₁X₁X₁HSX₂X₃QX₁CLRX₁VRVNX₂VQQX₁C[^] (SEQ ID
NO:27);
Conotoxin-P2: GX₁X₁X₁HSX₂X₃QX₁CLRX₁VRVNNVQQX₁C[^] (SEQ ID
NO:28);
Conotoxin-P3: GX₁X₁X₁HSX₂X₃QX₁CLRX₁IRVNX₂VQQX₁C[^] (SEQ ID
NO:29);
Conotoxin-P4: GX₁AX₁HX₃AFQX₁CLRX₁INVNX₂VQQX₁C[^] (SEQ ID
NO:30);
Conotoxin-P5: GLX₁X₁DIX₁FIX₁TIX₁X₁I# (SEQ ID NO:31);
Conotoxin-Sm1: ITX₁TDIX₁LVMX₂LX₁X₁I# (SEQ ID NO:32);

wherein X₁ is Glu or γ-carboxyglutamic acid (Gla); X₂ is Lys, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys or N,N,N-trimethyl-Lys; X₃ is Tyr, mono-halo-Tyr, di-halo-Tyr, O-sulpho-Tyr, O-phospho-Tyr or nitro-Tyr; X₄ is Trp (D or L) or halo-Trp (D or L); X₅ is Pro or hydroxy-Pro; and X₆ is Gln or pyroglutamate.

Claim 2 (original): A derivative of the peptide of claim 1, in which the Arg residues may be substituted by Lys, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Lys residues may be substituted by Arg, ornithine, homoargine, nor-Lys, or any synthetic basic amino acid; the Tyr residues may be substituted with meta-Tyr, ortho-Tyr, nor-Tyr, mono-halo-Tyr, di-halo-Tyr, O-sulpho-Tyr, O-phospho-Tyr, nitro-Tyr or any synthetic hydroxy containing amino acid; the Ser residues may be substituted with Thr or any synthetic hydroxylated amino acid; the Thr residues may be substituted with Ser or any synthetic hydroxylated amino acid; the Phe residues may be substituted with any synthetic aromatic amino acid; the Trp residues may be substituted with Trp (D), neo-Trp, halo-Trp (D or L) or any aromatic synthetic amino acid; the Asn, Ser, Thr or Hyp residues may be glycosylated; the Tyr residues may also be substituted with the 3-hydroxyl or 2-hydroxyl isomers (meta-Tyr or ortho-Tyr, respectively) and corresponding O-sulpho- and O-phospho-derivatives; the acidic amino acid residues may be substituted with any synthetic acidic amino acid; and the aliphatic amino acids may be substituted by synthetic derivatives bearing non-natural aliphatic branched or linear side chains C_nH_{2n+2} up to and including $n=8$.

Claims 3-4 (canceled).

Claim 5 (Currently amended): An isolated conopeptide propeptide having an amino acid sequence ~~set forth in Table 4~~ selected from the group consisting of the amino acid sequences set forth in SEQ ID NO:37, SEQ ID NO:40, SEQ ID NO:43, SEQ ID NO:46, SEQ ID NO:49, SEQ ID NO:52, SEQ ID NO:55, SEQ ID NO:58, SEQ ID NO:61, SEQ ID NO:64, SEQ ID NO:67, SEQ ID NO:70, SEQ ID NO:73, SEQ ID NO:76, SEQ ID NO:79, SEQ ID NO:82, SEQ ID NO:85, SEQ ID NO:88, SEQ ID NO:91, SEQ ID NO:94, SEQ ID NO:97, SEQ ID NO:100, SEQ ID NO:103, SEQ ID NO:106, SEQ ID NO:109, SEQ ID NO:112, SEQ ID NO:115, SEQ ID NO:118, SEQ ID NO:121, SEQ ID NO:124, SEQ ID NO:127, and SEQ ID NO:130.

Claims 6-24 (canceled).

Claim 25 (new): The isolated peptide of claim 1, wherein the peptide is conotoxin-Bt5.

Claim 26 (new): A derivative of the peptide of claim 25, in which the Arg residues may be substituted by Lys, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Lys residues may be substituted by Arg, ornithine, homoargine, nor-Lys, or any synthetic basic amino acid; the Ser residues may be substituted with Thr or any synthetic hydroxylated amino acid; the Thr residues may be substituted with Ser or any synthetic hydroxylated amino acid; the acidic amino acid residues may be substituted with any synthetic acidic amino acid; and the aliphatic amino acids may be substituted by synthetic derivatives bearing non-natural aliphatic branched or linear side chains C_nH_{2n+2} up to and including $n=8$.

Claim 27 (new): The isolated peptide of claim 25, wherein the peptide has the sequence GGGX₁VRX₁SAX₁TLHX₁ITP[^] (SEQ ID NO:138).

Claim 28 (new): A derivative of the peptide of claim 27, in which the Arg residues may be substituted by Lys, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Lys residues may be substituted by Arg, ornithine, homoargine, nor-Lys, or any synthetic basic amino acid; the Ser residues may be substituted with Thr or any synthetic hydroxylated amino acid; the Thr residues may be substituted with Ser or any synthetic hydroxylated amino acid; the acidic amino acid residues may be substituted with any synthetic acidic amino acid; and the aliphatic amino acids may be substituted by synthetic derivatives bearing non-natural aliphatic branched or linear side chains C_nH_{2n+2} up to and including $n=8$.

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Claim 29 (new): The isolated conopeptide propeptide of claim 5, wherein the peptide has the amino acid sequence set forth in SEQ ID NO:73.